THE EFFECT OF VARIATION POST-HYDROTHERMAL TEMPERATURE ON ELECTROCHEMISTRY CAPACITOR’S CAPACITIVE PROPERTY FROM TUNGSTEN TRIOXIDE (WO₃) MATERIAL RESULT OF SOL GEL PROCESS

Name : Amir Zamroni
NRP : 2708 100 039
Department : Metallurgical and Materials Engineering, ITS
Lecture : Diah Susanti, S.T., M.T., Ph.D.

Abstract
Many studies conducted to develop new technologies that can convert and store energy like a capacitor. This study aims to make electrochemical capacitors of the nanomaterial synthesis Tungsten trioxide (WO₃) from Tungsten hexachloride (WCl₆) and alcohole by sol-gel method, then coated on graphite substrate by spincoating method.

Then heated by post-hydrothermal process inside a furnace for 12 hours with various temperatures those are 160°C, 180°C, and 200°C. XRD, SEM, and BET analyzer is conducted to study its crystals structure, morphology, and surface area. Capacitor measurements using Cyclic Voltammetry tests (CV) and electrochemical measuring instruments Potentiostat. The larger active surface area, the greater the capacitive value of capacitor WO₃. The smaller the rate of a given scan rate, the greater the value obtained capacitive. Largest capacitive value at sample with 180°C heating is 5.17 F / g and its active surface area of 72.853 m² / g.

Keyword : Tungsten trioxide (WO₃), electrochemistry capacitor’s, sol-gel, post hydrothermal, cyclic voltammetry.